WHAT IS CLAIMED IS:

1. A fast-search adaptive motion accuracy search method for estimating motion vectors in motion-compensated video coding by finding a best motion vector for a macroblock, said method comprising the steps of:

(a) searching a first set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_1 to find a best motion vector V_2;

(b) searching a second set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_2 to find a best motion vector V_3; and

(c) searching a third set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_3 to find said best motion vector of said macroblock.

2. The method of claim 1, said step of searching a first set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_1 to find a best motion vector V_2 further comprising the step of searching a first set of eight motion vector candidates in a grid of 1/2-pixel resolution of square radius 1 centered on V_1 to find a best motion vector V_2.

3. The method of claim 1, said step of searching a second set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_2 to find a best motion vector V_3 further comprising the step of searching a second set of eight motion vector candidates in a grid of 1/6-pixel resolution of square radius 1 centered on V_2 to find a best motion vector V_3.

4. The method of claim 1 further comprising the steps of using V_2 as the motion vector for the block if V_2 has the smallest rate-distortion cost and skipping step (c) of claim 1.

5. The method of claim 1, said step of searching a third set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_3 to find said best motion vector of said macroblock further comprising the step of searching a third set of eight motion vector candidates in a grid of 1/6-pixel resolution of square radius 1 centered on V_3 to find said best motion vector of said macroblock.

6. The method of claim 1, said step of searching a third set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_3 to find said best motion vector of said macroblock further comprising the step of skipping motion vector candidates of said third set of motion vector candidates that have already been tested.

7. The method of claim 1 further wherein said step of searching said first set of motion vector candidates further comprises the step of searching said first set of motion vector candidates using a first filter to do a first interpolation, said step of searching said second set of motion vector candidates further comprises the step of searching said second set of motion vector candidates using a second filter to do a second interpolation, and said step of searching said third set of motion vector candidates further comprises the step of searching said third set of motion vector candidates using a third filter to do a third interpolation.

8. The method of claim 1, said step of searching a second set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_2 to find a best motion vector V_3 further comprising the steps of:

(a) searching three candidates of 1/3-pel accuracy V_2 and a 1/2-pel location with the next lowest RD cost if V_2 is at the center;

(b) searching four vector candidates of 1/3-pel accuracy that are closest to V_2 if V_2 is a corner vector; and

(c) determining which of two corners has lower RD cost and searching four vector candidates of 1/3-pel accuracy that are closest to a line between said corner with lower RD cost, if V_2 is between two corners vectors.

9. An adaptive motion accuracy search method for estimating motion vectors in motion-compensated video coding by finding a best motion vector for a macroblock, said method comprising the steps of:

(a) searching a first set of motion vector candidates in a grid centered on V_1 to find a best motion vector V_2 using a first filter to do a first interpolation;

(b) searching a second set of motion vector candidates in a grid centered on V_2 to find a best motion vector V_3 using a second filter to do a second interpolation; and

(c) searching a third set of motion vector candidates in a grid centered on V_3 to find said best motion vector of said macroblock using a third filter to do a third interpolation.

10. The method of claim 9 wherein said step of searching using a first filter to do a first interpolation further comprises using a simple filter to do a coarse interpolation.

11. The method of claim 9 wherein said step of searching using a first filter to do a first interpolation further comprises using a simple filter to do a coarse interpolation and said step of searching using a second filter to do a second interpolation further comprises using a complex filter to do a fine interpolation.

12. The method of claim 11 wherein said step of searching using a third filter to do a third interpolation further comprises using a complex filter to do a fine interpolation.

13. The method of claim 9 wherein said step of searching using a first filter to do a first interpolation further comprises using a bilinear filter to interpolate the reference frame by 2x2.

14. The method of claim 9 wherein said step of searching using a first filter to do a first interpolation further comprises using a bilinear filter to interpolate the reference frame by 2x2 and said step of searching using a second filter to do a second interpolation further comprises using a cubic filter to do a fine interpolation.

15. The method of claim 14 wherein said step of searching using a third filter to do a third interpolation further comprises using a cubic filter to do a fine interpolation.

16. An adaptive motion accuracy search method for estimating motion vectors in motion-compensated video coding by finding a best motion vector for a macroblock, said method comprising the steps of:

(a) searching at a first motion accuracy for a first best motion vector of said macroblock;

(b) encoding said first best motion vector and said first motion accuracy;

(c) searching for at least one second best motion vector of said macroblock at an at least one second motion accuracy;

(d) encoding said at least one second best motion vector and said at least one second motion accuracy; and

(e) selecting the best motion vector of said first and at least one best motion vectors using rate-distortion criteria.

17. The method of claim 16 wherein said step of selecting the best motion vector using rate-distortion criteria further comprises the step of said rate-distortion criteria adapting according to the different motion accuracies to determine both the best motion vectors and the best motion accuracies.

18. The method of claim 16, said step of searching for at least one second best motion vector at an at least one second motion accuracy further comprising the step of searching for at least one second best motion vector of said macroblock at an at least one second motion accuracy that is finer than said first motion accuracy.

19. The method of claim 16 wherein said step of selecting the best motion vector using rate-distortion criteria further comprises the step of using rate-distortion criteria of the type "distortion + L*Bits" to select the best motion vector.

20. An adaptive motion accuracy search method for estimating motion vectors in motion-compensated video coding by finding a best motion vector for a macroblock, said method comprising the steps of:

(a) searching at a motion accuracy for a best motion vector of said macroblock;

(b) encoding said motion accuracy using a code from a VLC table that is interpreted differently at different coding units according to the associated motion vector accuracy; and

(c) encoding said best motion vector in the respective accuracy space.

21. A system for estimating motion vectors in motion-compensated video coding by finding a best motion vector for a macroblock, said system comprising:

(a) a first encoder for searching a first set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_1 to find a best motion vector V_2;

(b) a second encoder for searching a second set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_2 to find a best motion vector V_3; and

(c) a third encoder for searching a third set of motion vector candidates in a grid of sub-pixel resolution of a predetermined square radius centered on V_3 to find said best motion vector of said macroblock.

22. The system of claim 21 wherein said first, second, and third encoders are a single encoder.